REMARKS

I. Indefiniteness Rejection of Claims 1 to 8

Claims 1 to 8 were rejected under 35 U.S.C. 112, second paragraph, for indefiniteness.

Claims 1 to 8, which were misdiscriptive and contained translation errors, have been canceled. New claims 9 to 19 have been filed.

New claims 9 to 19 include independent claims 9 and 13 for measurement probes, independent claim 16 for an array of measurement probes and independent claim 18 for a measurement procedure using the measurement probes. The measurement probe claims are based on the probe structure shown in Fig. 1 and the associated disclosure in the detalled description on pages 7 and 8 of the specification. The measurement procedure claim 18 is based on the canceled claim 7 and the disclosure on pages 8 and 9, especially page 8, line 2 to 14, of applicants' specification.

In answer to the question on page 2 of the Office Action, the measurement probe is used for measuring electrical conductivity according to the measurement procedure claim 18 and also canceled claim 7. The measurement probe is claimed as a combination of a sensor-active solid layer (4), a covering film (7) that covers the solid layer (4) and electrodes (2) arranged in contact with the solid layer (4). Electrical property measurement devices are electrically

connected to the electrodes in practice to the measure electrical properties.

The basic electrical properties measured are electrical conductance and changes in electrical conductance. The manner in which the presence of the agent in the liquid or gaseous medium over the covering film (7) changes the conductance is explained on page 8, line 2 to line 15, of the specification. The molecules of the agent are absorbed on the solid layer (4) and on the covering film (7). They replace molecules in the covering film (7) and thus form an "active surface", which is "active" in the sense that it changes the conductance at that interface.

The measurement procedure is now claimed in new claim 18. Conductance measurements, as is well known in the art, are performed with oscillating electrical potentials, as stated, e.g. on page 8, lines 23 to 27, of applicants' specification. The equivalent circuit for the measurement probe is shown in Fig. 2. There are contributions to the impedance measurements from the supporting material (3), the solid layer (4), the covering film (7), gaseous state and particularly the active surface (8), which is changed according to the type and amount of the agents. Separate partial conductances of these different parts of the measuring probe contribute to the total conductance of the measuring probe. The changes in the total conductance can be used to determine the amount of the agent after calibration. Of course in calibration one would prepare test samples of a gaseous or liquid medium with a known agent in several different amounts and then measure the conductance of each sample with the different amounts of the agent.

The term "EDP" is a commonly known term of art in the data processing industry and means "electronic data processing".

The new claims 9 to 19 have been drafted in accordance with U.S. Patent Office Rules and are not merely English translations of the claims of the corresponding German Priority Document. Thus they have been drafted so as to provide antecedent basis for claim terms.

Measuring probe claims 9 and 13 claim different embodiments of the measuring probe. The embodiment of claim 9 is a measuring probe for detecting and/or measuring concentrations of agents in a gaseous medium, while the embodiment of claim 13 is a measurement probe for a liquid medium. The canceled claim 1 claimed both these embodiments because it used the wording "in gases and/or liquids" in line 3.

The conductance property is not mentioned in claims 9 and 13 because it is not directly relevant to the claimed probe structure. In other words, the same probe might be used to measure a somewhat different electrical property.

For the foregoing reasons and because of the new wording used in the new claim 9 to 19, it is respectfully submitted that none of the new claims 9 to 19 should be rejected under 35 U.S.C. 112, second paragraph, for indefiniteness.

II. Changes in the Abstract

The original abstract was not in an acceptable form because it was not in a single paragraph and the description of the invention was not in proper grammatically correct idiomatic English. Approval of the amended abstract is respectfully requested.

III. Rejection based on Choulga, et al, U.S. Patent 6,004,442

1. Anticipation based on Choulga, et al

Claims 1 to 7 were rejected as anticipated under 35 U.S.C. 102 (b) by Choulga, et al, WO 96/12176, evidenced by U.S. Patent 6,004,442.

Claims 9 to 18 contain subject matter from canceled claims 1 to 7 as well as additional features and limitations to distinguish them patentably from the cited prior art, Choulga, et al (as evidenced by U.S. Patent 6,004,442 A).

The sensor-active solid layer of the present claims 9 to 19 is fundamentally different from the analyte-specific layer of Choulga, et al.

Choulga, et al, claims a sensor having an analyte-specific layer containing coupling elements (see claim 1). The coupling elements are necessary parts of the analyte-specific layer of Choulga's invention (claim 1, about line 8; column 4,

lines 30 to 40; column 10, lines 15 to 20) and selectively remove the agent or analyte from the liquid above the layer. The coupling elements include cation exchangers, anion exchangers and complex formers (see claims 32 and 33 of U.S. Patent 6,004,442). Applicants' measuring probe does not need these coupling elements to function and does not include them in the sensor-active solid layer. In a preferred embodiment, the sensor-active solid layer of applicants consists of an organic semiconductor polymeric material (e.g. see claim 10 and the disclosure on page 7 of the specification).

The broader disclosure of Choulga, et al, in columns 3 and 4, also states that the sensor can operate with materials that lack the particular coupling elements recited above. For example, see column 3, lines 35 to 50. However the analyte-specific layer of Choulga, et al, must be just that – analyte-specific. According to column 4, line 30 to 40, it must be designed so that it alters its layer electrical properties in the presence of the agents and extracts the agent through it. Thus some of the agent in Choulga, et al, must be taken directly into the layer.

The sensors of Choulga, et al, in contrast to the applicants' measuring probe, can only detect a particular agent or agents, which will be absorbed.

The sensors of Choulga, et al, are only useful in liquids according to Choulga, et al, whereas the applicants' measuring probe can be used in gaseous media as well as liquid media.

Furthermore because the analyte-specific layer or the polymeric membrane layers actually extract the agent or agents, the concentration of these agents builds up in the layer and eventually the sensor can no longer make

quantitative measurements during the measuring period.

Applicants use a sensor-active solid layer without any specific coupling elements or structure to extract the agent from the gaseous or liquid medium, i.e. take the agent into its bulk. Choulga, et al does not limit the analyte sensitive layer to a solid layer, because the analyte-sensitive layer can be a liquid also according to Choulga, et al (see claim 1).

Also Choulga, et al, does not teach the *a covering film (7) consisting of liquid*, e.g.water, from the gaseous or liquid medium, *which covers the solid layer (4)*, as claimed in claims 9 and 13. Choulga, et al, do not disclose this liquid covering film (7). Fig. 1 only shows the liquid medium 4 in which the agents, whose concentrations are measured, are found.

The solution 4 shown in Figs. 1 and 2 of Choulga, et al, is not the covering film (7). No covering film is illustrated in these figures, only a bulk solution or liquid medium. The element shown by "4" in these figures is equivalent to applicants' liquid medium (see column 13, line 49).

Furthermore the covering film 7 is liquid according to claim 9 and would not necessarily be formed from the gaseous medium in all cases, especially in the case of a water film. In the case of claim 13 the liquid of the liquid film does not necessarily need to be the same as the liquid medium. In fact, applicants teach on page 6 of applicants' English language specification:

> "The adsorption characteristics for certain agents can be optimized by the systematic selection of the liquid for the covering film."

Also note that the specification states that the electrical properties, especially

conductance measurements, are influenced by the covering film in a beneficial manner. For example, on page 7 of the specification it states that the sensitivity of the conductivity measurements is improved by several powers of ten because of the present of the covering film.

In order to anticipate under 35 U.S.C. 102 (b) each and every element (i.e. limitations of the independent claims) must appear in a single prior art reference, used to reject the claims, either expressly or inherently (MPEP 2131).

Choulga, et al, does not teach that the analyte-specific layer is covered by a *liquid* covering film (7). The covering film 7 forms an active surface (8) that effects or influences conductivity, because molecules of the film are replaced by molecules of the agent. This can be detected when the conductivity is measured with the measuring probe. Thus the film 7 is an active part of the measuring probe. This type of replacement is reversible and no analyte-specific donation of the agent or agents to the layer underneath the film is required in applicants' measuring probe.

Choulga, et al, does not limit the analyte-specific layer to a solid layer.

These limitations are not present in the independent claim 1 of Choulga, et al. When applicants' claim more narrowly than the disclosures of the reference, the basis for the rejection cannot be anticipation.

Regarding the dependent claims, there is no disclosure or suggestion in Choulga, et al, that the analyte-selective layer consists of an organic semiconductor polymer (claim 10).

2. Obviousness Based on Choulga, et al

Choulga, et al, teaches a measuring probed comprising an analyte-specific layer in contact with electrodes, which changes its conductance properties by extracting or absorbing a specific agent into its bulk, preferably using the coupling elements as described above. According to column 4, lines 30 to 40, of Choulga, et al, U.S. Patent 6,004,442, the electrical properties change because there is a change in distribution between the solution and the analyte-specific layer. That means that the concentration of the agents in solution decreases and the agents are taken into the analyte-specific layer. This applies to all embodiments of the analyte-specific layer in Choulga, et al, even those without coupling elements.

In contrast, applicants' measuring probe operates on a different principle, as explained above. The agent molecules are adsorbed on the solid layer 4 and replace part of the liquid covering film, thus changing its electrical or conductance properties. This is explained in more detail above.

Thus to modify the disclosure of Choulga, et al, to obtain the applicants' invention would change the basic principle of operation of the measuring probe of Choulga, et al. Such modification is not permitted under 35 U.S.C. 103 (a) because no suggestion or hint in the art is strong enough to indicate a fundamental change in the basic principle of operation of e.g. a measuring probe. See, for example, M.P.E.P. 2143.01 and *In re Ratti*, 123 USPQ 349 (CCPA

1959).

In addition, Choulga, et al, clearly leads one skilled in the art away from the claimed invention because it requires a layer in contact with the electrodes that acts to absorb the agents from the liquid medium, while the applicants' probe provides an additional liquid covering film that adsorbs the agent molecules and thus changes its contribution to the total conductance measured by the probe.

Also there are no suggestions of the differences between applicants' claimed invention and Choulga, et al, in the prior art.

For the foregoing reasons and because of the changes in the claims, it is respectfully submitted that new claims 9 to 19 should not be rejected under 35 U.S.C. 102 (b) as anticipated by Choulga, et al, or under 35 U.S.C. 103 (a) as obvious from Choulga, et al.

IV. Rejection of Claim 8 based on Choulga, et al, and Tawil, et al

The features of canceled claim 8 are not essential features of the invention and are not relied on to distinguish the claimed invention from the art. They are features of a preferred embodiment of the measurement procedure.

The features of canceled claim 8 are currently present in claim 19.

Claim 19 should be allowed because it depends on a claim 18 for the procedure using the measuring probe according to claims 9 and 12 of the invention. The features of the measuring probe patentably distinguish the

measuring procedure of claim 18 and also 19 from the prior art cited against them, namely Choulga, et al, and Tawil, et al.

For the foregoing reasons it is respectfully submitted that none of the new claims 9 to 19 should be rejected under 35 U.S.C. 103 (a) as obvious from Choulga, et al, and Tawil, et al.

Should the Examiner require or consider it advisable that the specification, claims and/or drawing be further amended or corrected in formal respects to put this case in condition for final allowance, then it is requested that such amendments or corrections be carried out by Examiner's Amendment and the case passed to issue. Alternatively, should the Examiner feel that a personal discussion might be helpful in advancing the case to allowance, he or she is invited to telephone the undersigned at 1-631-549 4700.

In view of the foregoing, favorable allowance is respectfully solicited.

Respectfully submitted,

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